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ABSTRACT

A study explored the prospects for systemic reform by examining how four Michigan elementary school teachers make sense of and respond to recent subject matter reforms in reading, writing, and mathematics. The teachers, recommended by district supervisors as teachers who were engaging reforms in their classrooms, were interviewed and were observed in their classrooms. Each teacher's responses to subject matter reforms were examined along four dimensions: (1) the reforms encountered and how each teacher viewed these initiatives in relation to his/her past practice; (2) what each teacher believed s/he needs to learn and the learning opportunities taken; (3) the evidence of reform-minded ideas in each teacher's daily instruction; and (4) the changes in each teacher's assumptions about teaching and learning reading, writing, and mathematics. Results indicated significant variation across teachers' responses and across reforms: not only did the four teachers manage, for example, reading reforms differently, but an individual teacher's responses varied across reading, writing, and mathematics. Findings suggest that understanding teachers' experiences can help educators see something of the nature of educational change at the classroom level as well as the promises and problems of efforts such as systemic reform. (Contains 24 references, 5 tables of data, and 3 notes.) (RS)

Reforming Reading, Writing, and Mathematics and the Prospects for Systemic Reform

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Reforming Reading, Writing, and Mathematics and the Prospects for Systemic Reform

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Historian Donald Warren (1989) observes that educational reform is as "American as apple pie." Since World War II, efforts to reform schools and classrooms have been persistent and pervasive. But what does all this activity mean, especially in light of efforts to produce "systemic reform?" In this paper, I explore the prospects for systemic reform by examining how four Michigan elementary school teachers' make sense of and respond to recent subject matter reforms in reading, writing, and mathematics. More specifically, I look at how two issues--a) the variation within and across teachers' responses to these reforms, and b) the interaction of personal, organizational, and policy factors as a means of explaining this variation--problematize basic assumptions of the systemic reform movement.

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The current crop of subject matter reforms date from the mid-1980's when reports like A Nation at Risk portrayed American schools in decline. The first wave looked familiar. These policies tinkered with regulations like student graduation credits and teacher certification standards. These initiatives altered some aspects of schooling, but left important dimensions of teaching and learning largely untouched.

This is changing. More recent reforms, especially those offered in the name of systemic reform, speak more directly to these issues. This new breed of educational reforms--e.g., the California frameworks in mathematics and language arts, the Michigan reading policy, and the curriculum and evaluation standards developed by the National Council for Teachers of Mathematics--promote ambitious intellectual and pedagogical goals. These reforms are notable in at least three ways. First, they urge new educational goals. Past initiatives alternatively aimed low or only at selected students. Current reforms express promising, if problematic, aims: high academic standards for all students. Second, current reforms challenge teachers' modal knowledge, practices, and assumptions. Often reflecting constructivist views, reformers tender new conceptions of subject matter content, teaching, and learning.

The third way in which recent reforms differ from those of the past is that they represent system changing efforts. The phrase "systemic reform" represents a movement to reconceptualize both the problem and the solutions to educational change. Advocates of systemic change describe the "problem" as the system itself. Low test scores, poorly trained teachers, unequal resources, and the like are important issues. Reformers see these as symptoms, however, rather than as the illness. The illness is the "fragmented, complex, multi-layered educational policy system" (Smith & O'Day, 1991, p. 237). The systemic "solution," in turn, begins with the state. Local educators have an important role in effecting systemic change. Education has always been a state responsibility, however, and reformers view the state (i.e., state departments of education) as the "critical actor" (Smith & O'Day , 1991, p. 245). Part of the state responsibility is to define a vision of education. With that vision in hand, state leaders must then construct new and ambitious curriculum frameworks, coordinate key policies (e.g., curriculum, assessment, certification), and restructure school guidance to increase flexible decision-making (Fuhrman, 1993; O'Day & Smith, 1993; Smith & O'Day, 1991).

Consider Michigan as an example of a state engaged in the systemic agenda. There, among other things, state-level policymakers have been working since the early 1980's to construct ambitious new curriculum frameworks and assessment tools in reading, writing, and mathematics. They have mandated a school improvement process and they have encouraged school districts to develop site-based management strategies. In the crucible of state-level policymaking, these efforts are consistent with two key assumptions about systemic reform (Fuhrman, 1993; Smith & O'Day, 1991). One is the notion that, while policy making is essentially a state function, implementation is a local issue. The second assumption is that teachers and others will know what to do with new standards and assessments once they receive them and that aligning curriculum frameworks and state tests will produce more consistent and coherent instruction across classrooms. As I will argue in the second part of this paper, both these assumptions turn out to be problematic.

What does all this reform-minded activity mean? One way to answer that question is to look at what many observers see as a critical element--teachers. Advocates of systemic reform presume that teachers can and will embrace new policies and effect fundamental changes in their classroom practices. But how do teachers interpret these efforts? Do these reforms encourage deep changes in teachers' beliefs and practices? What do their responses look like? What explains the variation in their responses? And what does the variation in teachers' responses imply about the prospects for systemic reform?

In this paper, I describe and compare how four Michigan elementary school teachers' make sense of and respond to new and challenging subject matter reforms. I examine each teacher's responses along four dimensions: 1) the reforms encountered and how each teacher views these initiatives in relation to his/her past practice; 2) what each teacher believes s/he needs to learn and the learning opportunities taken; 3) the evidence of reform-minded ideas in each teacher's daily instruction; and 4) the changes in each teacher's assumptions about teaching and learning reading, writing, and mathematics. That comparison suggests significant variation across teachers' responses and across reforms. That is, not only do the four teachers' manage, for example, reading reforms differently, but an individual teacher's responses vary across reading, writing, and mathematics reforms. I explain these two forms of variation by looking at the interaction of personal, organizational, and policy influences. I conclude by using this analysis of teachers' reform responses to explore the prospects for the current movement in favor of systemic reform.

Methodology

This paper is based in my work on the Educational Policy and Practice Study (EPPS) located at Michigan State University. That project is a multi-year study of the relationships between and among national, state, and local education reform efforts and school/classroom practices in literacy and mathematics.

Data for this paper and the larger study were gathered over four years through interviews, classroom observations, and document analysis. Here I draw primarily on interviews and observations of four elementary school teachers selected through recommendation by district supervisors as teachers who were engaging reforms in their classrooms.

The participants were elementary school teachers in two Michigan school districts. Bonnie Jones is a fifth grade teacher with over 25 years of experience. Her colleague, Frank Jensen, was an elementary school principal before going back to the classroom 13 years ago. Jensen teaches a combination third/fourth grade class of "underachieving gifted" students.[1] Jones and Jensen teach in rural, working class Donnelly-King Elementary, which is representative of most schools in the

[1] Jensen terms his 16 third and fourth graders "academically interested and talented" with "above average potential." They are "right-brained, holistic learners" and "non-linear thinkers," Jensen explains, whose needs are not met due to a "mismatch between their learning styles and the basic curriculum."

Derry school district. Marie Irwin, a veteran of some 10 years, is a sixth grade teacher in upscale Sanford Heights Elementary. Paula Goddard has been teaching second grade for three years at Sheldon Court Academic Center, an alternative school whose population is primarily poor and African American. Sanford Heights and Sheldon Court represent a good part of the diversity represented in Hamilton, a large, urban school district.

Interview protocols were open-ended and broadly constructed. Questions focused on how teachers learned about national, state, and local reforms in reading, writing, and mathematics, what sense they made of these initiatives, and what accommodations (if any) they made in their teaching practice. Teachers' classrooms were observed at least twice a year. These observations lasted 1-2 days during each cycle and lasted the entire school day. Observation guides were used to assist in the documentation and analysis of, for example, the content taught, instructional approaches used, materials used, and the nature of the discourse between teacher and students and among students. Document analysis was conducted in several areas: state level reform documents, district and school-level policies, textbooks and other curriculum material, state and district standardized assessments, teacher prepared materials, student assignments.

My analysis reflects the interpretative tradition within qualitative research (Bogdan & Biklen, 1982; Connelly & Clandinin, 1990; Erickson, 1992). To analyze these data I coded field notes and interview transcripts with three principal interests in mind. First, I coded for when and how teachers learned about each reform. Second, I looked at each teacher's daily instruction and whether or not reform-minded practices surfaced. Finally, I examined the assumptions around teaching, learning, and subject matter implicit in each teacher's talk and practice. I then used this analysis to explore the assumptions behind and the argument for systemic reform as a means of profound educational change.

Reforming Reading, Writing, and Mathematics

Comparing teachers' responses to reforms in reading, writing, and mathematics, a range of similarities and differences surface. Some similarities emerge across the four teachers' responses to each reform. For example, all four teachers give more attention to reading reforms than either writing or mathematics. Similarities also emerge across reforms. For example, while Bonnie Jones responds differently to reading and writing reforms, her enthusiastic responses to reading and mathematics reforms share several commonalties. Similarities also appear in Jones's third/fourth grade colleague Frank Jensen's modest responses to reading and mathematics reforms. Paula Goddard, an urban second grade teacher, seeks big changes in her reading practice and she declares similar intentions in writing. Finally, suburban sixth grade teacher Marie Irwin's responses to reading and writing reforms are quite different at a fine-grain level. But at a general level, she aims to mix old and new practices.

These similarities notwithstanding, it is the differences that stand out. Consider the example of Marie Irwin. Reading and writing reforms inspire no particular challenge or concern. She makes some instructional changes in both areas, but she senses no profound incompatibilities between her views and reformers'. The situation is quite different with mathematics. Though state reformers have promoted reforms in mathematics as well as reading and writing, Irwin effectively ignored mathematics reforms for years. She recently concluded, however, that reforms offer new and different approaches, and that her practice is not in "sync." Among other things, Irwin's personal discomfort with mathematics encouraged her to avoid changing her instruction. Her professional discomfort in believing that her practice is out of "sync" now encourages her to entertain thoughts of reform-minded change. How she will proceed is not clear. But Irwin's nascent interest in mathematics reforms illustrates both how her responses differ from other teachers' responses and from her attention to other reforms.

The variation across teachers' responses is, in some sense, predictable. More surprising, however, is the variation across reforms. This is no small point. For while several studies illustrate the first condition (see, for example, Cohen, 1991; Heaton, 1993; Jennings, 1996; Schwille et al, 1983), virtually none recognize the second.[2]

How then are we to understand the variation in teachers' responses to reforms? A number of discrete factors might be used to explain the variation across and within teacher's responses. Some of those factors concern the nature of policy and the special problems of constructivist subject matter reforms. Others involve features of the loosely-coupled organizations teachers work in and the autonomous nature of teachers' labor. Still others highlight complex and contextualized issues of learning and teachers' individual knowledge, beliefs, and experiences.

Evidence of each of these factors percolates throughout the four teacher cases. But these factors explain neither discretely nor generically. I develop a more complex, but more satisfying, explanation by considering these factors in interaction and in context. In effect, I argue that the variation in teachers' responses reflects policy and organizational factors, but only as they interact with personal factors such as an individual teachers' knowledge, beliefs, and experiences. What teachers know and are willing to do influences their responses to reforms. Yet their responses also reflect their interpretations of the policy and organizational opportunities available and settings in which they learn. Teachers respond to policy, but they do so in contexts which they help shape and are shaped by. Though complex, the richness gained by this contextual analysis should contribute to both academic and practical conversations about changing teachers' extant classroom practices.

The Variation in Teachers' Reform Responses

Before looking specifically at the cross teacher and cross reform variation in teachers' responses to reading, writing, and mathematics reforms, consider the variation across the teachers' global responses to reforms. Table 1 compares the four teachers' responses along four dimensions: 1) how each teacher views reforms in light of her/his current instructional practice; 2) what each teacher believes s/he needs to learn and the learning opportunities taken; 3) the evidence of reform-minded ideas in each teacher's daily instruction; and 4) the changes in each teacher's assumptions about teaching and learning reading, writing, and mathematics.

Table 1: Variation in Teachers' Global Responses to Reforms

Teachers	View of Reforms	Learning	Influence on Daily Practice	Influence on T/L Assumptions
Bonnie Jones 5th/rural	Challenge past practice	Much to learn; seeks multiple opportunities	Many, big changes	Big questions; some big changes

[2] Some researchers (see, for example, Stodolsky, 1988; Wood, Cobb, & Yackel, 1990) have looked at teachers' practices across school subjects. To my knowledge, however, none has looked at how teachers respond to reforms in multiple subject matters.

Frank Jensen 3rd/4th/rural	Extend past practice	Little new to learn; chooses selectively	Few, superficial changes	No questions; no changes
Marie Irwin 6th/urban	Different from past practice, but little challenge	Little new to learn; ignores opportunities	Few, moderate changes	Developing questions (math); no changes
Paula Goddard 2nd/urban	Challenge past practice	Much to learn; seeks opportunities	Few, big changes	Some big questions; some big changes

Here we see that, while Bonnie Jones and Frank Jensen teach in the same rural, working class school, they differ dramatically in the way they view reforms, what they think they need to learn and how aggressively they seek it, the scope of changes that emerge in their daily practice, and the kinds of changes that emerge in their assumptions about teaching and learning. Where Bonnie Jones embraces reforms as a challenge to her past practice, Frank Jensen's response is more modest.

Similar, but less dramatic, differences emerge in the second set of teachers. Marie Irwin and Paula Goddard teach in the same urban district, but Irwin teaches sixth grade in an upper-middle class school while Paula Goddard teaches second grade in a magnet-like school for poor African-American students. Irwin generally approaches reforms warily. She sees little new for her to learn and she has made few changes in her practice. Paula Goddard, by contrast, takes a much more ambitious approach. She interprets reforms as a call to rethink her instructional practice and she believes she has much to learn in order to teach in reform-minded ways.

The Cross-Teacher Variation in Reform Responses

Turning to the cross-teacher comparison, considerable variation develops as we look at teachers' specific responses to reading, writing, and mathematics reforms.

Let's focus on reading first. All four teachers claim to embrace reading reforms like teaching reading strategies and using trade books. But there are big differences in what teachers feel they need to learn, the kinds of changes they have made in their daily practice, and in their assumptions about teaching and learning reading.

Table 2: Variation in Responses to Reading Reforms

Teachers	View of Reforms	Learning	Influences/ Daily Practice	Influences/ Assumptions
Bonnie Jones	embraces reforms as challenge to past practice	sees much to learn; seeks opportunities	big changes in materials, activities	raises questions; is changing assumptions

Frank Jensen	embraces reforms as consistent with past practice	sees little to learn; ignores opportunities	few changes in materials, activities	raises no questions about assumptions
Marie Irwin	embraces reforms as consistent with past practice	sees little new to learn; ignores opportunities	moderate changes in materials, activities	raises no questions about assumptions
Paula Goddard	embraces reforms as challenge to past practice	sees much to learn; seeks opportunities	some big changes in materials, activities	raises some questions about assumptions

Here we see some similarities, especially between Bonnie Jones and Paula Goddard and between Frank Jensen and Marie Irwin. Nevertheless, there are important degrees of difference across the four teachers in terms of the influence of reforms on their daily practice and on their assumptions about teaching and learning reading.

The variation across teachers is even wider in mathematics. In Table 3, we see four very different approaches.

Table 3: Variation in Responses to Mathematics Reforms

Teachers	**View of Reforms**	**Learning**	**Influences/ Daily Practice**	**Influences/ Assumptions**
Bonnie Jones	embraces reforms as challenge to past practice	sees much to learn; seeks opportunities	big changes in materials, activities	raises questions; may be changing assumptions
Frank Jensen	embraces the language of reforms	sees little to learn; ignores opportunities	no changes in materials, activities	raises no questions about assumptions
Marie Irwin	ignored reforms until recently	sees little new to learn; seeks no opportunities	small changes in materials, activities	raises some questions about assumptions
Paula Goddard	reversed course on reforms	sees little to learn; ignores opportunities	no changes in materials, activities	raises no questions about assumptions

Bonnie Jones embraces mathematics reforms Frank Jensen ignores them; Marie Irwin also ignored them until recently; and Paula Goddard reversed course--after initially making a number of changes in her mathematics practice, she now teaches primarily from her textbook.

Those approaches ripple along the other dimensions. Bonnie Jones interprets reforms as a fundamental challenge to her extant practice. Not surprisingly then, she seeks opportunities to learn more about new pedagogical approaches, she tries out a variety of those approaches in her classroom, and she is questioning some of her assumptions about teaching and learning mathematics. By contrast, Paula Goddard has reversed course in mathematics. Two years ago she had made a number of radical changes to her very traditional drill and practice approach. For example, she adopted the Mathematics Their Way program (Baratta-Lorton, 1976) and developed learning centers around mathematics topics. Last year, however, her school adopted a new, literature-based reading series and Goddard suddenly found herself making big changes in her reading practice. As a result, she reversed course, letting the changes in her mathematics program slide and returning to a more traditional practice. She avers a desire to bring back the ambitious changes of two years ago, but she has stopped seeking opportunities to learn more about mathematics reforms and she seems uninterested in questioning her assumptions about teaching and learning mathematics.

The cross-teacher variation in reform responses continues in writing. Table 4 represents yet another range of responses.

Table 4: Variation in Responses to Writing Reforms

Teachers	View of Reforms	Learning	Influences/ Daily Practice	Influences/ Assumptions
Bonnie Jones	acknowledges reforms as challenge to past practice	sees much to learn; sought no opportunities	few changes in materials, activities	raises some questions about assumptions
Frank Jensen	embraces reforms as a new practice	sees little to learn; ignores opportunities	big changes in materials, activities	raises no questions about assumptions
Marie Irwin	embraces reforms as extension of past practice	sees little new to learn; ignores opportunities	moderate changes in materials, activities	raises no questions about assumptions
Paula Goddard	embraces reforms as challenge to past practice	sees much to learn; seeks opportunities	some big changes in materials, activities	raises some questions about assumptions

Again, we see extensive variation across teachers and classrooms. Bonnie Jones has only recently engaged new ideas in writing; Frank Jensen, by contrast, has made some big changes in his writing instruction. Marie Irwin and Paula Goddard have both made some changes, but while Goddard thinks she has much more to learn and do, Irwin does not.

The Cross-Reform Variation in Reform Responses

As I noted before, variation across teachers' responses is not unexpected. We have lots of empirical evidence which suggests that how teachers respond to reforms varies across classrooms. We know much less, however, about the variation within an individual teacher's responses to multiple reforms. Consider the example of Bonnie Jones as represented in Table 5.

Table 5: Variation Across Reform Responses: Bonnie Jones

	View of Reforms	Learning	Influences/ Daily Practice	Influences/ Assumptions
Reading	embraces reforms as challenge to past practice	sees much to learn; seeks opportunities	big changes in materials, activities	raises questions; is changing assumptions
Mathematics	embraces reforms as challenge to past practice	sees much to learn; seeks opportunities	big changes in materials, activities	raises questions; may be changing assumptions
Writing	ignored reforms until recently	now sees much to learn; seeks opportunities	few changes in materials, activities	raises some questions about assumptions

There are several similarities between reading and mathematics. But there are also differences. For example, while she seems to be changing her assumptions about teaching and learning in reading, this is less clear in mathematics.

It is her approach to writing reforms, however, which looks most different: She has ignored ideas about process forms of writing and conferencing with students until recently; She sees she has much to learn, but she has not been as active as she has in reading and mathematics; Bonnie Jones has made some changes, but the bulk of her traditional grammar approach remains; and she seems to be just beginning to ask some questions of her assumptions about teaching and learning to write.

Explaining the Variation in Teachers' Reform Responses: The Interaction of Personal, Organizational, and Policy Factors

How do we explain this cross-teacher and cross-reform variation in responses to reforms? Observers have long explained differences among teachers through a range of discrete factors. Some of those factors are the ambiguous nature of policy (Kingdon, 1984) and the special problems of constructivist subject matter reforms (Schwille et al, 1983). Others involve features of the loosely-coupled organizations teachers work in (Cohen & Spillane, 1992) and the autonomous

nature of teachers' labor (Lortie, 1975). Still others highlight complex and contextualized issues of learning (Grant, 1997) and teachers' individual knowledge, beliefs, and experiences (Eisenhart, Shrum, Harding, & Cuthbert, 1988).

While evidence of each of these factors percolates throughout this study, these factors explain neither discretely, generically, nor consistently. I develop a more complex, but more satisfactory, explanation by considering these factors in interaction and in context. I argue that the variation in teachers' responses reflects policy and organizational factors, but only as they interact with an individual teachers' knowledge, beliefs, and experiences. What individual teachers know and are willing to do influences their responses to reforms. Yet their responses also reflect their interpretations of the organizational opportunities available and settings in which they learn. Teachers respond to policy, but they do so in contexts which they help shape and, in turn, are shaped by.

Consider the example of Bonnie Jones. Personal factors figure largely in explaining Jones's ambitious response to reforms. Jones cites the death of a child, the break-up of her first marriage, and a sense of personal ennui as contributing factors in her quest to reframe her teaching practice.

> I guess I started questioning everything. I started questioning my faith, my teaching, the experts, and it just seemed like the world started to change. Things just took on a different perspective....I knew something had to change, but I didn't know what....

These personal factors play out in a variety of ways. As she says, Bonnie Jones was "ready" for a change. But she also attributes much of her embrace of reading reforms, for example, to individual factors such as her love for reading and wanting kids to have similar experiences. Personal factors also play into her avoidance of writing reforms. As she says,

> [Writing] is a weak area of mine. I always have to push myself to do it. I avoid it because I'm not very good at it. I have to get better, but it takes a real a conscious effort.

The case of mathematics is more complex. She has embraced reforms yet she acknowledges a weak background in mathematics and mathematics teaching. In contrast to many elementary teachers, however, Jones seems not to hold mathphobic feelings. She asserts that she has much to learn and she has pursued numerous opportunities to do so.

The influence of individual factors or resources seems clear enough. But organizational influences also seem important. 's strong response to reading reforms, for example, comes in a context of state, district, and school-level support. She has had access to the state policy, new texts, and lots of professional development opportunities. Jones does not believe these have all been equally helpful. But the influence of these organizational factors on her enthusiastic response seems pretty clear. By the same token, Jones's weaker response to writing reforms also seems a function of organizational factors. In contrast to reading, state, district, and local resources for writing have been far fewer. There is a new state policy, but there has been little state-level activity. Locally, neither Jones's school nor district has done anything with new approaches to writing.

Sorting out individual and organizational influences on a teacher's responses to reforms helps expose each. But it also suggests that if we are going to explain those responses and the variation among them, we need to consider individual and organizational influences in interaction. Consider just one example: Bonnie Jones's different responses to reading and mathematics textbooks.

Bonnie Jones knew a lot about reading when she decided to abandon the new district textbook in favor of trade books. The university courses, conferences, and workshops she attended convinced her that trade books were a superior option and that she could use them instead of a

textbook. As she said, "To them [district administrators] it was literature-based. To me, that's not my interpretation of literature-based." So she distributes them, but they sit unused in students' desks. Bonnie Jones might feel constrained if she was forced to use the district textbook. But she isn't. Teachers have considerable instructional latitude in her school. Bonnie Jones feels confident that she can provide a strong and coherent reading program using trade books and that her decision will not be interfered with.

Given this response, one might expect Jones would also reject the district new mathematics textbooks when they came along later. She claims to embrace mathematics reforms as strongly as she does reading. She knows that math textbooks have problems. And she has ancillary materials which could be substituted for textbook lessons. But Bonnie Jones believes that she knows considerably less about mathematics and teaching mathematics than she does about reading. So in this instance, using an organizational resources like the textbook makes sense to her: It provides a familiar structure and allows her to feel confident she is covering the "right" material especially in light of district standardized mathematics tests. She supplements textbook lessons with ancillary materials. But she has no immediate plans to abandon her mathematics textbook as she has the reading text.

The notion that individual, organizational, and policy influences affect teachers' responses to reforms is not new. But typically, analyses have privileged one set of factors over the other--policy or organizational or individual, but rarely all three. Seeing the interaction of these various influences is complex and messy and hard. But it is also necessary both to help us understand how teachers respond and to help us consider new conceptions and approaches to policymaking and implementation.

Teachers' Responses to Reforms and the Prospects for Systemic Reform

Understanding the cross teacher and cross reform variation in responses and the interaction of personal, organizational, and policy factors in explaining that variation is useful in several ways. In this section, however, I use these findings to explore the prospects for the current movement known as "systemic reform."

The rhetoric of systemic reform has a genuine appeal in no small measure because it is clear and rational. Reality, however, is rarely as clear or as rational as theory. It is not unreasonable, then, to suspect that there might be some slippage as the rhetoric of the systemic solution rubs up against the realities of life in state education departments, local district offices, and school classrooms. The two slippages I focus on here involve the division between policymaking and implementation and the role of teacher interpretation.

The Division Between Policymaking and Implementation

Systemic reformers argue for centering policymaking at the state level and, correspondingly, for centering implementation at the local level. They do so based on the premise that, while common state-wide goals are crucial, instructional conditions vary across localities. Teaching decisions, presumably then, are best made at the local level. Make no mistake, systemic reformers want instruction to change. They assume, however, that local actors are best positioned to enact those changes.

These commonsensical notions are, nevertheless, problematic in practice. True, implementation of the state agenda, if it is going to happen, must happen at the local level. But local educators also "make" policy and often do so largely independently of state efforts. Those educators, in Michigan at least, enact many agendas and only some of them are the state's.

In Michigan, state-level policymakers generated ambitious new curriculum frameworks, revised state tests, and provided money for district-level professional development. Michigan Department of Education curriculum specialists conducted some state-wide meetings and inservices around these initiatives. Most of the professional development teachers report attending, however, came through school and district-level workshops and the occasional university course. In this sense, then, Michigan educators followed the systemic reformers' script: Policymaking at the state level; implementation at the local.

As this approach unfolds, however, two implications develop. One is that local actors apparently do not limit their attention to state initiatives. The state may assume that it is setting curriculum policy, but local educators appear to feel free to consider or to ignore the state agenda. This observation suggests that policymaking and policy implementation are not so easily separated and that districts play an important role in mediating state curriculum policy. In short, the various actions taken by local administrators can be described as easily as policy making as implementation. To underscore this point, consider how each district handled reading, writing, and mathematics reforms.

Derry administrators sent clear messages that reading was primary. This is the only subject matter where, in addition to adopting a new textbooks series, a district consultant was available, a week-long inservice was scheduled, and a school trade book program was developed. By contrast, administrators gave considerably less attention to mathematics and writing: A new mathematics textbook series was adopted and a publisher-sponsored workshop was held; writing received no district-sponsored attention apart from the district reading coordinator's modest individual efforts. Hamilton administrators sent more complex messages. Reading and math were clearly the district's highest concerns as evidenced by their prominence in the district's highly structured instructional guidance system.[3] District administrators gave little if any attention, however, to state policies in these areas. Hamilton teachers learned about the state reading policy from their school reading teachers, but learned nothing more from the district about reading reforms of any kind until a textbook pilot several years later. District administrators also ignored the state mathematics policy, though in an independent action it purchased manipulatives kits for each elementary school classroom. Finally, the district seemed to address writing reforms by purchasing (in advance of the state policy) a new English textbook series which featured the writing process. These importance of these actions was undercut, however, by a lack of district follow-through for teachers who wanted to learn more.

All this suggests that local administrators attended as much to the ends of these reforms as the means. In other words, in making decisions what they would and would not attend to and what resources would be devoted to each area, local administrators were establishing curriculum goals as well as enacting them. In this sense, then, district administrators mediated the state policy agenda. Doing so did not preclude teachers from pursuing their own interests. In fact, each of the teachers in this study demonstrated some interest in areas beyond their districts' explicit priorities--Bonnie Jones and Marie Irwin in mathematics, Frank Jensen and Paula Goddard in writing. Those interests meant, however, that teachers often had to look beyond local resources for assistance.

The nature of district decisions and resources suggests a second implication for the systemic assumption about the need to separate policy making from implementation. Simply put, systemic reformers assume that district leaders will know how to teach teachers to transform their practices and that they will have the appropriate resources to do so. In practice, however, this assumption is

[3] The several components include mandated use of district-adopted textbook series in core content areas along with required instructional time allotments, a pacing scheme for reading and mathematics instruction and assessment, a monitoring system whereby teachers must keep and turn into their principals detailed charts of the lessons they teach and how students perform on textbook chapter and unit tests, and a district developed essential skills test in reading and mathematics for all students K-12.

highly suspect. One problem is that districts try to do too much too fast. Like teachers who aim for content coverage rather than student understanding, district leaders push a constant stream of reforms past teachers. This study reports on teachers' responses to reforms in three major curriculum areas. Note, however, that each teacher also deals with other reforms in science, health, and, for the Derry teachers, outcomes-based education. At the very least, this blizzard of change pulls teachers' time, energy, and attention in multiple directions. At its worst, it promotes a sense of moving on before real instructional changes can gel. Covering reforms is covering the curriculum: It is unlikely to produce substantive and sustained learning and change.

A second problem is the promotion of incompatible goals, especially around teaching and testing. With the exception of Frank Jensen, each of the teachers in this study expressed some version of the concern that making fundamental changes in their practices could disadvantage their students on standardized tests, particularly those administered locally. The Paula Goddard case is instructive here. Her students' scores increased the year she began using the Mathematics Their Way program. However, her students' scores went up even more the next year when she returned to a skills-based practice. Goddard's experience suggests it is no foregone conclusion that scores will fall off if teachers change their practices, but her case also underscores the notion that matching teaching to tests can pay off. Districts want teachers to improve their pedagogy, but they also want high test scores. To the extent that teaching and testing push in different directions, however, instructional changes may continue to be modest as both teachers and their administrators hope to avoid falling test scores.

There is one other problem with the systemic assumption that districts will be able to help teachers make the kinds of changes reformers' envision. Current reforms challenge much of what teachers know and do. Reformers agree that in order to teach reading, writing, and mathematics differently, teachers must learn to read, write, and do mathematics in deep ways. This sounds right for how can one expect students to think and act in new and rigorous ways unless their teachers can?

This premise is problematic, however, given the present professional development system. Among other things, there is a fundamental difference between professional development that focuses on "training" and that which emphasizes "education." The majority of professional development efforts take a training approach which assumes that teachers already possess much of the requisite knowledge and experience. Professional development, in that context, consists of demonstrating new instructional strategies which teachers can incorporate into their extant practices. By contrast, professional development as "education" implies that teachers will re-examine and revise their practices in light of new conceptualizations of teaching and learning. Behaviorism and constructivism are different ways of conceptualizing teaching, learning, and subject matter. Most teachers were schooled in the former; most reforms are rooted in the latter. To teach in reform-minded ways, then, requires education rather than training.

Other considerations emerge for the way district-level professional development is typically presented. First, professional developers often rely on short-term workshop approaches rather than extended learning opportunities. Education, however, is a long-term process. Changes of the types reformers envision simply will not come during one-shot, 30 minute workshops held after school (Grant, Peterson, & Shojgreen-Downer, 1996). Second, professional developers often fail to understand that teachers bring very different resources to their learning. Teachers generally have much more knowledge and experience as readers than they do as writers or mathematicians (Ball & Cohen, 1995; Graves, 1983). Consequently, opportunities to learn about reading may need to vary considerably from those around writing and mathematics. These two considerations suggest a third: Professional developers need to know and do much that is different for them. Just as students may not learn to think and act in ambitious ways if their teachers do not, it stands to reason that teachers may not learn to teach in ambitious ways if their teachers, the professional developers, hold to conventional approaches. Ironically, however, it professional developers often

"teach" reform-minded ideas in entirely pedantic ways (Grant, 1997). One last consideration involves time and resources. While these issues are always important, they are particularly so given the type of professional development sketched above. Training implies a certain efficiency. Education, especially when it challenges much of what one knows, is messy, complex, and slow. Some teachers, like Bonnie Jones and Paula Goddard may be motivated and resourceful enough to find the means necessary to learn about reform-minded practices. The experiences of Marie Irwin and Frank Jensen, however, suggest that standard professional development practices will not suffice.

Systemic reformers assume that ends can be constant and means can vary. Yet these are not unrelated phenomena--ends often define means and vice versa. Viewing local actors as only implementors, then, misses an important feature of local context: School and district administrators not only mediate the messages the state sends, but also the means by which teachers understand those messages. In so doing, however, local administrators face problems of trying to do too much too fast, promoting incompatible goals, and transforming their professional development efforts.

The Role of Teacher Interpretation

Systemic reformers slip one more time when they assume the messages the state broadcasts are the ones that teachers hear and that what they hear is what they will do. One problem is that state messages can be drowned out by messages from other sources, both national and local. Another problem is that there is no direct pipeline from state-level policymakers to teachers: School and district administrators play an important mediating role. But even if these problems did not exist, the systemic solution would still be problematic. For the simple fact remains that systemic reformers underestimate the role of teacher interpretation in their responses to reform.

In fact, systemic reformers rarely mention teachers and classrooms in anything other than a general sense. This seems odd given the small, but powerful literature (Firestone, 1989; Schwille et al., 1983; Weatherly & Lipsky, 1977) which casts teachers in an activist role in the policymaking process. It is hard to imagine that systemic reformers are unfamiliar with this literature. Yet, for whatever reason, they ignore it, banking instead on the power of state efforts driving coherence and change down through the system and into classrooms.

The Michigan experience suggests this expectation is problematic for several reasons. First, teachers were unaware of some state reforms. All four had read the state reading policy, but only one had read the new state mathematics policy and none had seen the writing policy. All four teachers knew that prevailing views were changing in these areas, but what they knew came largely from local, national, or university sources rather than the state. Second, even when teachers perceived reforms, from whatever source, they sometimes ignored them. Marie Irwin knew about new approaches to mathematics for several years; she had even been given a mathematical manipulatives kit. Yet until recently, she continued her skills-based practice without a second thought. Similarly, Bonnie Jones knew that her writing instruction was out-of-step with current thinking, yet, she too maintained a traditional instructional approach. Finally, when teachers perceived reforms and made changes in their practices, these changes were remarkably varied. Knowing about the state reading policy, for example, led to no common interpretation. Similarly, each teacher reacted differently to the textbooks their districts piloted or adopted. From these experiences, we understand that teachers may or may not see reforms as a challenge to their past practice, they may or may not see a need to learn anything new, and they may or may not make changes in their extant thinking and practices. Teachers recognize reforms as potential influences, but they read those influences in no singular way.

From a systemic view, this variation might be explained as a predictable result of the mixed messages sent by state and local policymakers. Reformers might be dismayed by this result, but

could hold out hope that this is a flaw in the particular actors rather than in the theory. And perhaps it is. Yet if state and local actions matter, they do so in interaction with individual factors. This effect is most clearly seen in Derry where Bonnie Jones and Frank Jensen were exposed to virtually the same range of state and local messages. These messages clearly had some effect on their respective practices. The variation in their responses, however, only makes sense when one considers their individual knowledge, beliefs, and experiences. For example, Bonnie Jones interpreted state policy as a basic and direct challenge to her whole approach to reading and she has made large-scale changes in her practice. Frank Jensen interpreted the same policy as part and parcel of his extant approach and his practice remains largely unchanged. A similar situation developed around the district-adopted mathematics textbook: Jones uses it as part of an expansive, reform-minded practice; Jensen uses it as the basis of his traditional skills-based practice. This pattern breaks down in writing, however, for neither teacher reports a serious state or local influence. Yet Jensen's writing instruction looks significantly more like reforms than Jones's does.

Three implications develop from these problems with the systemic solution. The first concerns the relationship among policy, organizational, and individual influences. The systemic solution gives clear priority to the first: State-level policy should alternatively encourage and/or drive change downward. Michigan policymakers brought potentially powerful influences to bear in the form of new curriculum frameworks, revised assessments, and the like. These efforts did influence some teachers' actions, but they influenced teachers in no singular way and they influenced teachers no more so than local administrative actions or the teachers' own knowledge, beliefs, and experiences. Influences exist, but they come from multiple sources, they interact, and they vary over time.

The second implication concerns the nature of the changes teachers make. Reforms call for new instructional approaches in reading, writing, and mathematics. Each of the teachers in this study has made changes. Only rarely, however, are those changes as sweeping and profound as reformers envision. In a gross sense, most changes are small and tacked-on; they are different from what the teacher has done in the past, but they signal no profound shift in the teacher's thinking or practice. Marie Irwin's response to writing reforms is a good example. She assigns more and more ambitious writing projects now. The bulk of her writing instruction, however, remains rooted in grammar and mechanics. Bonnie Jones is perhaps the best case of a teacher trying to enact profound changes in her practice. Given where she started, one could argue that she is transforming her teaching, at least in reading and mathematics. And yet, elements of traditional practice remain: pages of worksheet math problems and literal comprehension reading questions regularly appear. I mention this not to denigrate Jones's efforts for her case tells a stirring story of a teacher powerfully committed to more rigorous teaching. Bonnie Jones's practice simply reminds us that no change is wholesale and that teachers' best new efforts still reflect past practice in some fashion.

One last implication is a special case of the nature of the changes teachers made. Systemic reformers make no distinctions among the changes they expect of teachers: transforming one's teaching is presumably no different in mathematics than it is in reading. It is easy to see where this assumption comes from since the various subject matter reforms have a common root in constructivist thinking. The observation, then, that a teacher like Bonnie Jones could make profound changes in reading and virtually none in writing seems not to make sense. Yet clearly teachers bring different resources to bear when they encounter different reforms and so change in one area has no particular implication for change in another. The four teachers in this study, like elementary teachers across the country, tend to know more about and feel more skilled as readers than as writers or mathematicians. This fact did not disable them for some of the most profound changes occurred in these teachers' mathematics and writing practices. Nevertheless, the sense remains that the changes teachers made in their reading instruction were deeper and more sustainable than those in other subjects.

By definition, the systemic solution focuses on actions some distance from teachers and classrooms. Doing so makes some sense for, while teacher autonomy is a generally accepted dimension of classroom life, it is not complete. The influences on teachers' practices, however, are multiple, complex, and tenuous. State initiatives are part of the policy, organizational, and individual mix, but they hold no special sway. Thus, despite efforts toward alignment and coherence, teachers' responses to reforms vary considerably.

Conclusion

This study reflects a complex terrain. As ideas, reforms of reading, writing, and mathematics have import for the classroom teacher. They also have import for local administrators and for state-level policymakers. Focusing on reforms in these school subjects, I have attempted to move in two directions—toward individual teachers and classrooms through consideration of the responses of four Michigan elementary school teachers and toward policymakers through consideration of the movement toward systemic reform. The nature of the classroom teachers' responses reflect two forms of variation—cross-teacher and cross-reform. Understanding these teachers' experiences help us see something of the nature of educational change at the classroom level. Understanding those experiences also helps us see something of the promises and problems of efforts such as systemic reform.

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